Final Amendment 01 to
FINAL WORK PLAN/SITE SAFETY SUBMISSION
FORT MCCLELLAN, ALABAMA FOR
PELHAM RANGE SITE INVESTIGATION (LIMA POND, OLD WATER HOLE, AND FORMER DECONTAMINATION AREA SOUTH OF TOXIC GAS AREA)

VOLUME I
WORK PLAN

Prepared for

U.S. ARMY CORPS OF ENGINEERS, HUNTSVILLE CENTER
Mandatory Center of Expertise & Design Center
Ordnance and Explosive Waste

Prepared by

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March 2002

SECTION 1.0
PROJECT OVERVIEW

1.1 INTRODUCTION AND BACKGROUND

1.1.1 A Site Investigation (SI) for chemical warfare materiel (CWM) will be performed at three sites at Pelham Range, Alabama, formerly a portion of Fort McClellan.

1.1.2 Training with chemical warfare agents and related materials occurred at Pelham Range while the U.S. Army Chemical School was in operation from 1951 to 1973. As a result of this training, there are sites at Pelham Range that may be contaminated with chemical warfare agent. An Archives Search Report (ASR), that focused on Pelham Range sites suspected of containing CWM, was completed in February 2001 (USACE, 2001). Three of these sites are the focus of studies under this SI. These three sites are Lima Pond, Old Water Hole, and Former Decontamination Training Area South of the Toxic Gas Area (Former Decon Area). The purpose of this SI is to investigate those anomalies that are indicative of suspect CWM disposal locations. If chemical warfare agents are found at any time during the investigation of these sites, the SI objectives will have been met and further sampling will be curtailed with the concurrence of USAESCH. The SI objective is to determine the presence or absence of CWM or chemical agent in suspect disposal locations.

1.1.3 This document is Amendment 01 to the Final Work Plan/Site Safety Submission for Fort McClellan, Alabama, and has been prepared to specifically address unique issues and procedures for the for Pelham Range Site Investigation (Lima Pond, Old Water Hole, and Former Decontamination Area South of Toxic Gas Area). This Amendment was prepared under Modification 06 to Task Order 0029 to Contract DACA87-95-D-0018 (Appendix A). The fieldwork outlined in this Amendment will be executed under Contract DACA87-00-D-0038. This Amendment contains only changes and additions to the Final Work Plan / Site Safety Submission, Fort McClellan, Alabama (dated September 2000 with revisions through June 5, 2001). The section numbers in this Amendment correspond to the section numbers in Volumes I, II, and III of the Final Site Safety Submission. Although the Final Site Safety Submission describes an engineering evaluation/cost analysis (EE/CA) for Fort McClellan, this Amendment is limited to an SI for the three Pelham Range sites.

1.1.4 Pelham Range is northwest of the City of Anniston, Alabama within Calhoun County. It abuts the Anniston Army Depot to the south and is separated by about 6 miles from the main post of Fort McClellan. The 22,000-acre Pelham Range, originally called the Morrisville Maneuver Area, was acquired by the War Department in 1941 just prior to World War II in order to expand the training capacity of Fort McClellan. Many organizational elements from Fort McClellan, including the Chemical School, conducted training at Pelham Range. Although Fort McClellan has been closed

under Base Realignment and Closure (BRAC), firing ranges at Pelham Range continue to be used by the Anniston Army Depot and the Alabama Army National Guard. Pelham Range is currently licensed to the National Guard Bureau and is actively used by the Alabama Army National Guard. Figure 1.1 shows the relative location of Pelham Range to Anniston and the main post of Fort McClellan. Figure 1.2 shows the locations of the sites that will be investigated.

1.1.5 The rocky strata underlying Pelham Range consist primarily of Cambrian to Mississippian shales and carbonates. Drilling conducted during previous investigations at Lima Pond encountered limestone. Geologic maps indicate that the Lima Pond area is underlain by undifferentiated Tuscumbia Limestone and Fort Payne Chert. The Former Decon Area is underlain by Athens Shale or Newala Limestone and Little Oak Limestone. The Old Water Hole is underlain by the Knox Group, which consists of interlayered limestones and shales. The Knox Group at Pelham Range exhibits classic karst features including sinks, depressions, and lost streams.

1.1.6 Information on the three sites to be investigated was collected from the following sources:

- Reassessment of Fort McClellan, Anniston, AL Report No. 110A (ESE, 1984)
- Site Investigation Report, Fort McClellan, Alabama (SAIC, 1993)
- Environmental Baseline Study, Fort McClellan, Alabama (ESE, 1998)
- Remedial Investigation/Baseline Risk Assessment (RI/BRA), Fort McClellan, Alabama (SAIC, 2000)
- Preliminary Assessment No. 38-EH-1775-99 (USACHPPM, 1999)
- Archives Search Report, Ordnance and Explosives, Chemical Warfare Materials, Pelham Range, Final Report, U.S. Army Corps of Engineers, St. Louis District (USACE, 2001)
- Parsons Site Visit, May 2001

1.2 LIMA POND (RANGE L) BACKGROUND AND INVESTIGATION

Lima Pond (also known as Range L) is located within Training Area 10B of Pelham Range. The site is located near the middle of an area that was formerly designated the "Toxic Training Area"(USACE, 2001). Figure 1.2 illustrates the location of Lima Pond. The Lima Pond site consists of a shallow elliptical pond (approximately 0.1 acres) surrounded by a man-made berm ranging from about 5 to 15 feet in height above the pond. The water in the pond averages a few feet in depth, while the ground water level in monitoring wells surrounding the site is much deeper than the surface of the pond, implying that the water in Lima Pond is perched (SAIC, 2000). The berm is topped by a chain-link fence with one locked gate with signs stating "Caution, Restricted Access, Range L (Lima Pond), Chemical Munitions Disposal Area."

1.2.1 Lima Pond History

1.2.1.1 In the 1950s, the Chemical Corps School at Fort McClellan constructed a chemical, biological and radiological (CBR) tactical training exercise course at Pelham Range Training Area 10B. CBR officers and enlisted soldiers received training at a seven-station field course. Lima Pond was Station No. 5 of the field course. Station No. 5 included 5 or 6 radioactive sources (most likely cobalt-60) that were placed in a man-made crater (Lima Pond) to simulate residue from an atomic bomb. Students would do a radiological survey, record the results and continue on the course. Floating smoke pots were also reportedly used at Lima Pond. The CBR course was used from approximately 1955 to 1963.

1.2.1.2 In the 1984 ESE report, the statement that old captured World War II munitions, including chemical munitions, were placed in drums and disposed of in Lima Pond is attributed to an undated U.S. Army Environmental Hygiene Agency report. However, according to the ASR, there is no record of captured munitions ever being sent to Fort McClellan or any other supporting documentation for drums of chemical munitions being placed in Lima Pond.

1.2.2 Previous Investigations

1.2.2.1 In August 1993, SAIC issued a Site Investigation Report that described the environmental findings at 17 sites at Fort McClellan, Alabama including Lima Pond (SAIC 1993). The 1993 SI Report mentioned that in 1982 the U.S. Army Technical Escort Unit (TEU) collected three water samples from Lima Pond and tested them for the chemical agents, HD, GB, and VX. The results were all non-detect. A site visit by SAIC in October 1991 revealed the water depth as less than 2 feet. Also, empty ammunition crates were observed along the pond walls. SAIC did not conduct geophysical surveys at Lima Pond because TEU had previously conducted metal detection surveys that indicated large quantities of buried metal in the pond.

1.2.2.2 A follow-on Remedial Investigation and Baseline Risk Assessment (RI/BRA) was conducted by SAIC in the 1990's. The SAIC RI/BRA report dated 2000 states that the Lima Pond investigation included geophysical surveying, groundwater sampling, surface water sampling, sediment sampling and laboratory analysis of the samples. Ground water wells were established in the area surrounding the berm to assess potential migration of contaminants from the site. Pesticides and explosives, along with arsenic and manganese, were detected in surface water sampled from the pond. Geophysical data (frequency-domain electromagnetics (FDEM), time-domain electromagentics (TDEM), and magnetics) were collected over the pond. Figure 1.3 shows the TDEM data recorded by the bottom coil of the EM61 and the two suspect anomaly locations. The response of the EM61 is represented by a color level plot with each color indicating a different level of response in millivolts (mV). Colors at the top end of the color bar indicate higher responses and, consequently, the presence of metal. Colors at the bottom end of the color bar indicate responses near background. Figure 1.4

shows vertical magnetic gradient data presented as a color level plot. Anomalous responses are indicated by reading at the top and bottom of the color bar (near 10 and –10 nanoteslas per foot (nT/ft); background responses are near 0 nT/ft. These anomalies were not investigated during the RI/BRA but have been selected for investigation under this current effort.

1.2.2.3 As part of the data gathering efforts for the ASR, the vicinity of Lima Pond was visited during May and September 1999 (USACE 2001). The gate in the fence surrounding Lima Pond was locked, however, and the area was not entered. The ASR recommended assessing Lima Pond for OE due to its historical presence when the Chemical School was closed in 1973 and for radiological contamination based on its previous use as a CBR station.

1.2.2.4 A site visit to Lima Pond was conducted by Parsons on May 14 and 15, 2001. The area inside the fence was covered by young pines and thick undergrowth. The approximately 0.1-acre pond was shallow with the bottom visible over most of the pond, and water grass growing in much of it. The area around the pond was partially covered by young pines. The dirt road leading to the pond from the paved road to the south was in poor condition and was likely to be impassable during wet weather. Photo 1.1 depicts a view of Lima Pond during the May 2001 Site Visit.

Photo 1.1: Lima Pond

1.2.2.5 During the initial stages of the project, reacquisition of the SAIC anomalies indicated that the anomalies were associated with surface scrap. The surface scrap was removed (as per Section 1.2.3.1 below) and the area was scanned with both an EM61 and magnetometer. No additional anomalies were identified. It was concluded

that the SAIC anomalies were associated with surface scrap and that no intrusive investigation was warranted.

1.2.3 Current Site Investigation for Lima Pond

The investigation for Lima Pond addressed by this Amendment will involve site preparation, reacquisition of anomalies previously detected by SAIC during the remedial investigation, surface water and sediment sampling, surveying, and intrusive investigation and sampling of these anomalies as necessary. The following subsections describe the general components of this investigation.

1.2.3.1 Brush Clearing and Surface Debris Removal

1.2.1.3.1 Brush clearing will be conducted within the fence and around the exterior of the fence to allow access during geophysical reacquisition of anomalies and for equipment needed during the intrusive investigation. Mechanical equipment, such as bush hogs and land clearing machines, will be used where ground slopes allow. Steeper slopes will be cleared with chainsaws and weed-eaters. Vegetation with trunks up to 3 inches in diameter will be removed only where necessary for access. Cut vegetation will be either placed outside the fenced area or chipped in place. It may be necessary to remove a section of the fence on the northern side of the site where the berm is lower in order to allow equipment access for all phases of work. The fence will be repaired after completing the field investigation. Non-CWM or non-OE surface debris will be removed from the proposed survey area, but left onsite in a designated location. CWM or OE debris will be handled as described in Volume I of the Site Safety Submission, Section 8.3.

1.2.3.2 The survey and brush clearing crews will be accompanied by an UXO-qualified technician. The UXO-qualified technician will clear the area with a hand-held magnetometer prior to field crews entering a suspect area. A UXO-qualified technician will conduct a magnetometer survey of each area of intrusive activity to ensure that the area is anomaly-free prior to setting monuments, driving stakes, or establishing other points.

1.2.3.2 Intrusive Investigation

1.2.3.2.1 Prior to the intrusive operations, the Lima Pond site will be prepared by improving portions of the access road, establishing an exclusion zone, and establishing a command post. Two large anomalies based on the SAIC geophysical data have been selected for intrusive investigation and are shown in Figures 1.3 and 1.4. These anomalies were near the edge of the water observed during the May 2001 site visit. The original plan was for areas of the pond to be temporarily drained to allow for investigation. This would have been accomplished by digging a sump in an anomaly-free area within the pond to allow drainage of the area required for investigation, or creating a barrier with sandbags and plastic to isolate the anomaly to allow pumping. Instead, since no subsurface anomalies could be identified during reacquisition, no intrusive investigation will be required. Only surface water and sediment samples will be collected.

1.2.3.2.2 Geophysical anomalies that were identified for further investigation will be reacquired using an EM61. The locations will be marked by wooden stakes with ID numbers driven into the ground a short distance away from the anomaly in order to avoid contacting the buried metallic object. Large anomalous areas may need to be marked with a series of stakes around the perimeter.

1.2.3.2.3 Following the geophysical reacquisition, excavation will be conducted into suspect anomalies to assess the presence of CWM or degradation products. If any CWM, suspected CWM, or suspect soils are found, soil and water samples (if any in the excavation)will be taken. Based on the site history, samples will be analyzed for HD and L. A summary of the proposed investigation for Lima Pond is provided in Table 1.1.

Table 1.1 Lima Pond Investigation Summary

Activity	Components	Method	Analysis
Geophysical Reacquisition	Locate two suspect anomalies	EM61	None
Sampling	Surface water and sediment	Hand	Screened and analyzed for HD and L
Trenching	Excavation for identification of any accessible anomaly deemed suspect as a burial location	Backhoe or hand tool excavation. Pump, if needed.	Suspect soils for agent (HD and L) and degradation products

1.2.3.3 Land Surveying

At Lima Pond, the extent of the excavations, locations of all trench lines, and fence line locations will be established by a professional land surveyor registered and licensed in the State of Alabama. The locations will be referenced to the Alabama State Plane Coordinate System (Alabama East) and the North American Datum of 1983 (NAD83).

1.3 OLD WATER HOLE BACKGROUND AND INVESTIGATION

The Old Water Hole is in Training Area 5C of Pelham Range. The site is about 150 feet east of the road leading to the area depicted on maps as the Prisoner-of-War area, also known at T60. Figure 1.2 depicts the location of the Old Water Hole. The Old Water Hole is a shallow, topographic depression about 50 by 140 feet long. There is also a small circular depression to the north of the main depression. The main depression periodically fills with rainwater and does not readily drain. The water in the main depression is assumed to be perched since groundwater observed in nearby wells is significantly deeper, 40 to 50 feet or more. The depression is possibly a collapsed sinkhole that is lined with clays that allow slow drainage.

1.3.1 Old Water Hole History

As reported by one interviewee, the Old Water Hole was used for a period following World War II as a disposal site for "just about everything" (USACHPPM, 1999). Field expedient decontamination operations were reported to have occurred near the Old Water Hole in the 1960s. During other field expedient training, approximately 26, 50-lb cans of STB were used. After use, the STB containers were crushed, taken to the Old Water

Hole and thrown into the depression. During training exercises, fog oil drums were crushed (trucks would run over the drums) and were thrown into the depression. Smoke pots were also reportedly thrown into the depression. Although the Old Water Hole was noted in several reports, its location was unknown until the 1990s when Fort McClellan personnel identified the site.

1.3.2 Previous Investigations

1.3.2.1 Two site visits and magnetometer surveys by TEU were described in the SI Report (SAIC, 1993). During the October 1991 site visit by TEU, the depression was dry. The depression was under water during the April 1992 site visit. Based on the detection of a large concentration of metallic objects as the result of a metal detection sweep by TEU in 1992, further geophysical surveys, ground water, soil and surface water sampling were recommended in the SI Report.

1.3.2.2 The RI/BRA conducted in the late 1990's by SAIC at the Old Water Hole included geophysical surveys, field screening using MINICAMS, surface and subsurface soil sampling and analyses, and drilling and installing ground water monitoring wells with sample collection and analyses (SAIC, 2000). Review of the geophysical data indicates one large anomaly about 150 feet north of the main depression and several smaller anomalies scattered around the survey area. Figure 1.5 shows the response of the EM61 bottom coil data collected by SAIC. The instrument response in mV is indicated by a color level plot where higher values (at the upper end of the legend color bar) represent the presence of metal and low values (near 0 mV on the color bar) indicate readings near background. Figure 1.6 shows the total magnetic field intensity data collected by SAIC. The magnetometer response in nT is shown as a color level plot where high and low readings (at the top and bottom of the legend color bar) indicate anomalous responses and readings near the middle of the legend color bar indicating background responses. The locations of two large anomalies selected for intrusive investigation under this current investigation are also shown.

1.3.2.3 The MINICAMS was used to screen soil samples for HD, GB, and VX. Headspace screening did not detect any chemical agent. Forty-five samples from depths ranging from 1 to 20 feet were analyzed for the chemical agents HD, GB, and VX. These chemical agents were not detected in any of the soil samples collected. Chemical warfare agents, agent breakdown products, and explosives components were not detected in soil samples collected at the site. Isolated VOCs and SVOCs were detected as well as some metals. Groundwater sampling results indicated the presence of semi-volatile and pesticide compounds with isolated explosives-related and PCB concentrations. Surface water was not sampled.

1.3.2.4 The site visit conducted by Parsons on May 14 and 15, 2001 revealed a large amount of water in the depression. In general, the site was overgrown with many standing and fallen dead trees. Fallen trees and other organic debris are likely to cover the bottom of the Old Water Hole. See Photo 1.2 for a view of the Old Water Hole.

1.3.3 Current Site Investigation for Old Water Hole

The investigation for the Old Water Hole addressed by this Amendment will involve site preparation, reacquisition of anomalies previously detected by SAIC during the remedial investigation, surveying, and intrusive investigation and sampling of these anomalies. The following subsections describe the general components of this investigation.

1.3.3.1 Brush Clearing and Surface Debris Removal

1.3.3.1.1 Brush clearing will be conducted around the selected anomalies and along the access road from the paved road to the site. The purpose will be to allow access for personnel and equipment needed during the intrusive investigation. Parsons will supervise a brush clearing team provided by a local subcontractor supported by UXO-qualified technicians. Mechanical equipment, such as bush hogs and land clearing machines, will be used where the ground is firm. Vegetation along the edges of the water may need to be cleared with chainsaws and weed-eaters. Vegetation up to 3 inches in diameter will be removed as needed for access. Many large dead trees will also need to be cut down for safety of the work crews. Cut vegetation and surface debris will be placed outside the area of investigation or chipped onsite. CWM or OE debris will be handled as described in the Site Safety Submission, Section 8.3.

Photo 1.2: Old Water Hole

1.3.3.1.2 The survey and brush clearing crews will be accompanied by an UXO-qualified technician. The UXO-qualified technician will clear the area with a hand-held magnetometer prior to field crews entering a suspect area. A UXO-qualified technician

will conduct a magnetometer survey of each area for intrusive activity to ensure that the area is anomaly-free prior to setting monuments, driving stakes, or establishing other points.

1.3.3.2 Intrusive Investigation

1.3.3.2.1 The Old Water Hole site will be prepared for intrusive work by improving portions of the access road, establishing an exclusion zone, and establishing a command post. Anomalies shown in Figures 1.5 and 1.6 will be investigated using hand tools or mechanized excavating equipment. The two suspect anomalies are located outside the main body of water, but if necessary, local dewatering will be accomplished by pumping out water from an adjacent sump. The sump will be constructed in an anomaly-free area to allow drainage by creating a barrier with sandbags and plastic to isolate the anomaly to allow pumping.

1.3.3.2.2 Geophysical anomalies that were selected for further investigation from the SAIC geophysical data will be reacquired using an EM61. The locations will be marked by wooden stakes driven into the ground a short distance away from the anomaly in order to avoid contacting the buried metallic object. Large anomalous areas may need to be marked with a series of stakes around the perimeter.

1.3.3.2.3 Following the anomaly reacquisition, the suspect locations will be excavated to assess the presence of CWM or degradation products. If any CWM, suspected CWM, or suspect soils are found, soil and water samples (if any in the excavation) will be taken. Samples will be analyzed for agent (HD, L and GB) and breakdown products. A summary of the proposed investigation for the Old Water Hole is provided in Table 1.2.

Table 1.2 Old Water Hole Investigation Summary

Activity	Components	Method	Analysis
Geophysical Reacquisition	Locate two suspect anomalies	EM61	None
Trenching	Excavation for identification of any accessible anomaly deemed suspect as a burial location	Backhoe or hand tool excavation. Pumps, if needed	Suspect soils for agent (HD, L, and GB) and degradation products

1.3.3.3 Land Surveying

At the Old Water Hole, the extent of the excavations, trench lines, and water bodies will be established by a professional land surveyor registered and licensed in the State of Alabama. The locations will be referenced to the Alabama State Plane Coordinate System (Alabama East) and the North American Datum of 1983 (NAD83).

1.4 FORMER DECONTAMINATION TRAINING AREA SOUTH OF THE TOXIC GAS AREA BACKGROUND AND INVESTIGATION

The Environmental Baseline Study (ESE, 1998) places the Former Decontamination Area South of Toxic Gas Area in parcel 207(7)HR, which is across the road from Rideout

Hall. The roughly 100 ft by 150 ft area is a hillside, gently sloping downward to the north, and covered with a nearly continuous canopy of trees. See Figure 1.2 for the location of this area.

1.4.1 Former Decontamination Training Area South of Toxic Gas Area History

USACHPPM reported based upon interviews that training in decontamination was conducted by spreading chemical warfare agent on the ground in an area south of the Toxic Gas Area and north of the northern Radiological Field boundary fence (USACHPPM, 1999). Old vehicles were contaminated with H or HD (some spillage on the ground occurred) or the ground was contaminated with H or HD. The vehicle and the ground were decontaminated with STB slurry (26 50-lb cans of STB mixed with approximately 225 gallons of water. Excess agent was reportedly buried along the roads to the west and southwest of the site. This excess agent is considered to be bulk agent in soils, which is an HTRW concern and will be addressed under a separate investigation performed by another agency.

1.4.2 Previous Investigations

The area around Parcel 207(7)HR was investigated during the site visit by Parsons on May 14, 2001. Only numerous foxholes and other digging activity was observed.

1.4.3 Current Site Investigation for Former Decontamination Training Area South of Toxic Gas Area

The investigation for the Former Decon Area addressed by this Amendment will involve site preparation, geophysical surveying, soil sampling, surveying, and intrusive investigation and sampling of any identified anomalies. The following subsections describe the general components of this investigation.

1.4.3.1 Brush Clearing and Debris Removal

1.4.3.1.1 Over the entire Parcel 207(7)HR area, small trees, undergrowth and low branches will be removed to allow access for the geophysical survey and for equipment needed during the intrusive investigation. Mechanical equipment, such as bush hogs and land clearing machines, will be used where possible. Vegetation with trunks up to 3 inches in diameter will be removed where needed for access. Cut vegetation and other surface debris will be placed outside the investigation area or chipped on-site. Non-CWM or Non-OE debris will be handled as described in the Site Safety Submission, Section 8.3.

1.4.3.1.2 The survey and brush clearing crews will be accompanied by an UXO-qualified technician who will conduct visual UXO surveys for surface ordnance prior to field crews entering a suspect area and clear the area of each intrusive activity with a magnetometer to ensure that the site is anomaly-free prior to setting monuments, driving stakes, or establishing other points. Once an area has been cleared by a UXO-qualified technician, no escort will be required for non-intrusive activities, such as geophysical mapping, in that same area.

1.4.3.2 Land Surveying

Geophysical survey grids will be established by a professional land surveyor registered and licensed in the State of Alabama. The grid system will be surveyed and referenced to the Alabama State Plane Coordinate System (Alabama East) and the North American Datum of 1983 (NAD83). Where appropriate, locations will be marked with rebar and a wooden guard stake painted with high-visibility orange or pink paint.

1.4.3.3 Planned Geophysical Survey

A geophysical survey will be conducted over the entire area of Parcel 207(7)HR. The geophysical survey will be conducted twice; once using an EM61 and once using a magnetometer. Two instruments will be used as a cost-saving measure to eliminate the need for a geophysical prove-out for Pelham Range. Figure 1.7 shows the proposed layout of the geophysical survey grid.

1.4.3.4 Intrusive Investigation

1.4.3.4.1 The site will be prepared for intrusive work by improving access, where needed. Vegetation will have already been cleared for the geophysical survey.

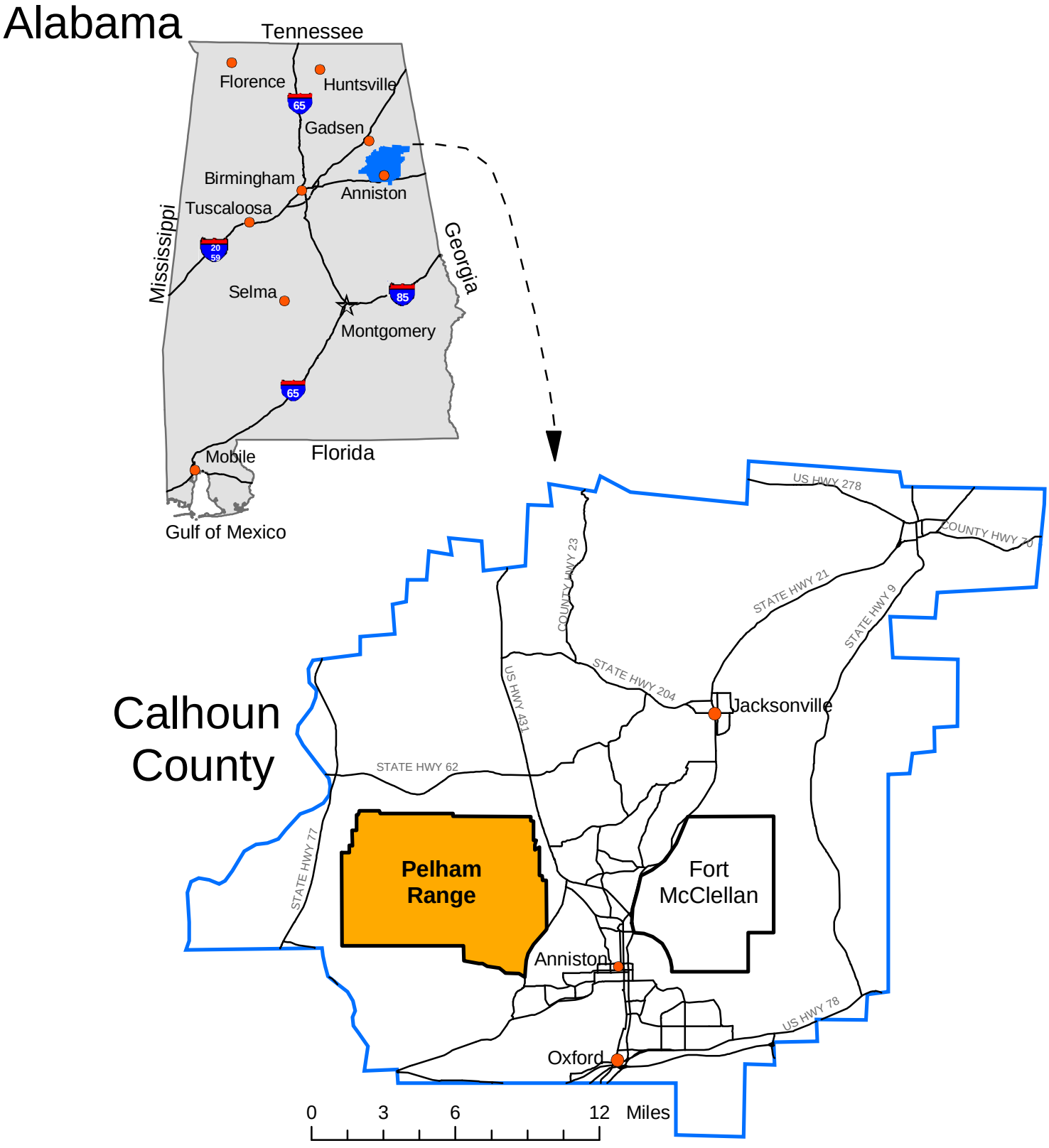
1.4.3.4.2 Geophysical anomalies that were identified for further investigation will be excavated to assess the presence of CWM or degradation products. If any CWM, suspected CWM, or suspect soils are found, soil samples will be taken from the excavation. In addition, 12 soil borings will be installed in a simple grid over the area. Figure 1.7 depicts their relative locations. Two soil samples will be collected at each boring, one sample at the surface and one sample at a depth of 2 feet. A summary of the proposed investigation for the Former Decon Area is provided in Table 1.3.

Table 1.3 Former Decontamination Training Area South of Toxic Gas Area Investigation Summary

Activity	Components	Method	Analysis
Geophysical Survey	Approximately 100 ft by 150 ft area	G-858 and EM61	Gridding and plotting of anomaly maps
Trenching	Excavation for identification of any anomaly suspected as a burial location	Backhoe or hand tool excavation	Suspect soils for agent (H, HD) and degradation products
Soil Sampling	12 soil borings (2 samples at each location)	Hand auger	Soil for agent (H, HD) and degradation products

1.5 PROJECT ORGANIZATION

See Section 1.4 of Volume I of the Final Site Safety Submission (September 2000) for a description of the Project Organization. Figure 1.8 shows the project organization for the Pelham Range SI.



Legend

- Alabama Cities
- Calhoun County Boundary
- Roads

N

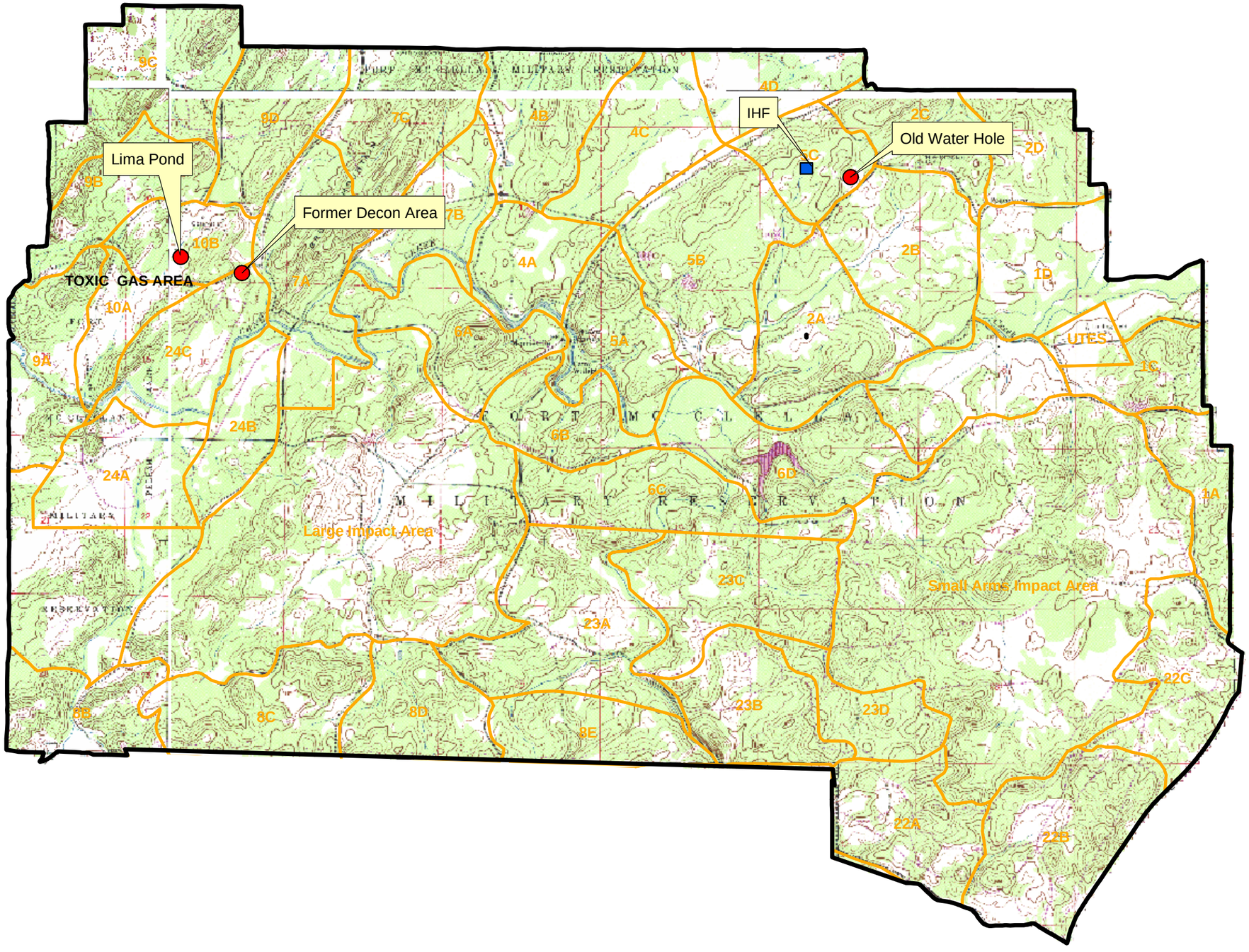
Pelham Range Site Location Map

Figure 1.1

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
DESIGNED BY: RED	PELHAM RANGE ANNISTON, ALABAMA CALHOUN COUNTY
DRAWN BY: RED	
CHECKED BY: RLS	SCALE:
SUBMITTED BY: RLS	PROJECT NUMBER: 740323
	DATE: December 2001
	FILE: X:\gis\740323\maps\Fig1_1_Locatordata\Locator1_1.mxd
	PAGE NUMBER:

Figure 1.2

Pelham Range Map



Legend

- Site To Be Investigated
- Interim Holding Facility (IHF)
- Training Area
- Pelham Range Boundary

N

0 1,800 3,600 7,200 Feet

	Revisions		
Symbol:		Date:	Approved:
	Source: USGS 7.5' Topographic Map, 1972		

PARSONS

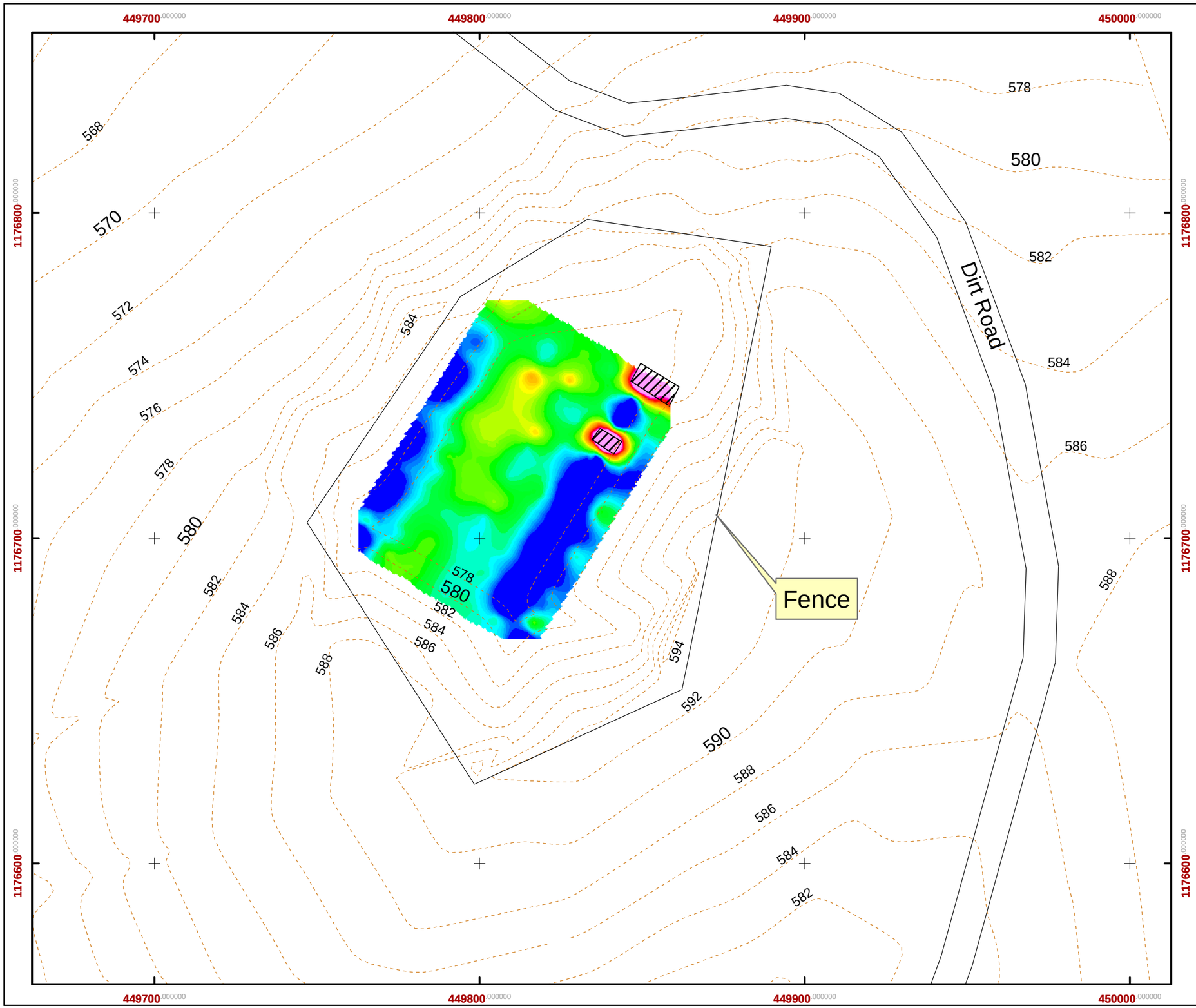
U.S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE

Designed by: MJBE	Figure 1.2 Pelham Range Map
Drawn by: MJBE	
Checked by: JAC	Date: August 2002 Page Number: 2-8
Submitted by: JAC	Scale: 1 inch Equals 3,600 feet
	File: X:\gis\740323\maps\site_invest_report\figure2_2.mxd

Project #: 741671

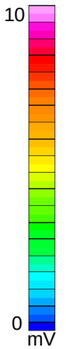
Figure 1.3

Lima Pond
SAIC Geophysical Survey
EM61 - Bottom Coil



Legend

- Anomaly to be Investigated
- Elevation Contour (2 ft interval)
- Fence
- Road



Metal Detector Response
EM61 - Bottom Coil

30 15 0 30 60 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER

DESIGNED BY: Parsons ES	Pelham Range Anniston, Alabama	
DRAWN BY: Parsons ES		
CHECKED BY: Parsons ES	SCALE: 1 inch equals 30 feet	PROJECT NUMBER: 740323
SUBMITTED BY: Parsons ES	DATE: February 2002	PAGE NUMBER: 1
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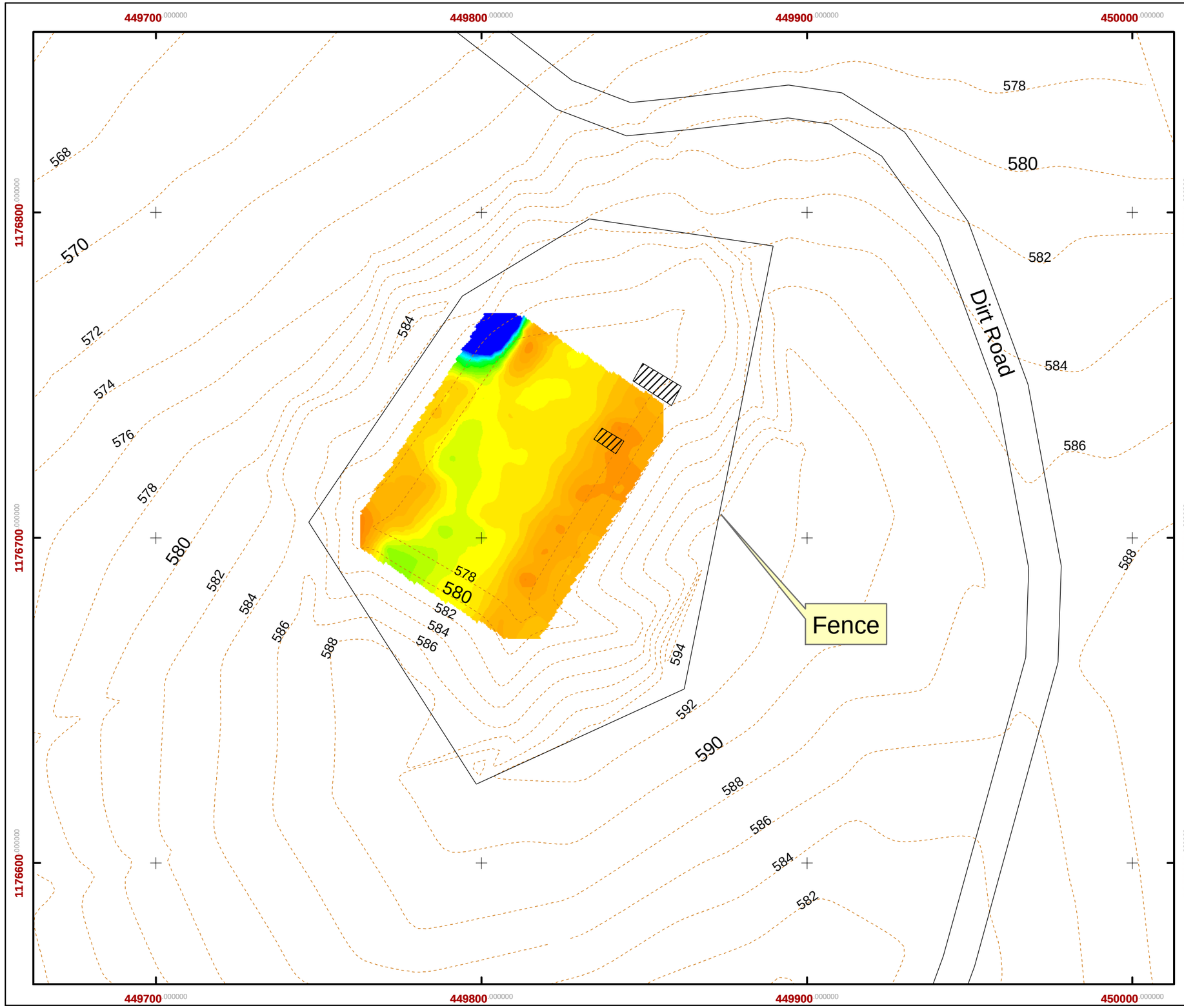
Figure 1.4

Lima Pond
SAIC Geophysical Survey
Vertical Magnetic Gradiant



Legend

- Anomaly to be Investigated
- Elevation Contour (2 ft interval)
- Fence
- Road

10
-10 nT/ft

Magnetometer Response
Vertical Magnetic Gradient

N

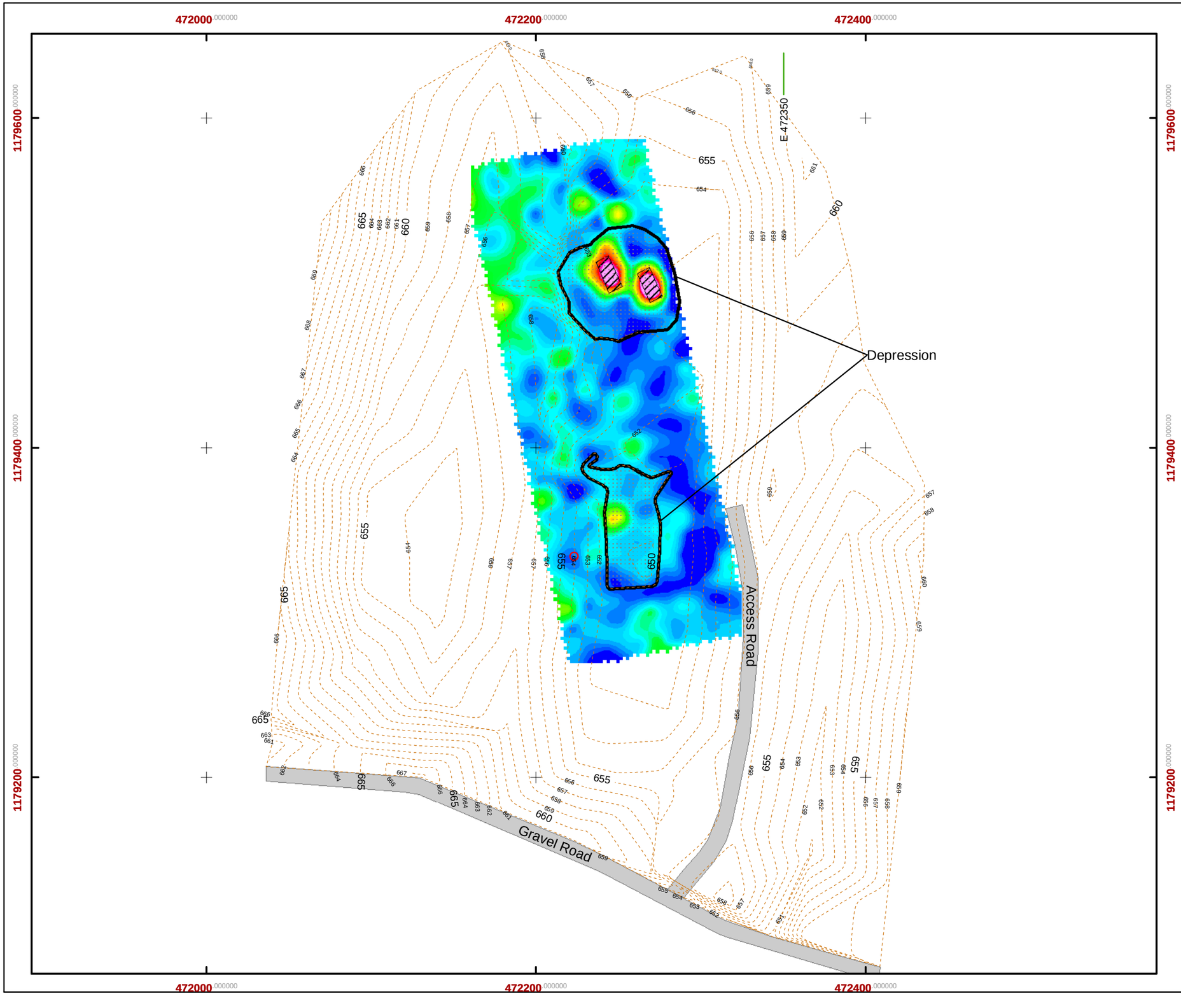
30 15 0 30 60 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER

DESIGNED BY: Parsons ES	Pelham Range Anniston, Alabama		
DRAWN BY: Parsons ES			
CHECKED BY: Parsons ES	SCALE: 1 inch equals 30 feet	PROJECT NUMBER: 740323	
SUBMITTED BY: Parsons ES	DATE: February 2002	PAGE NUMBER: 1	
	FILE: x:\gis\740323\maps\ Fig_1_4_geophys.mxd		

Figure 1.5

Old Water Hole
SAIC Geophysical Survey
EM61 - Bottom Coil



Legend

- Anomaly to be Investigated
- Estimated Depression
- Roadway
- Elevation Contour (2 ft interval)

10
0
mV

Metal Detector Response
EM61 - Bottom Coil

60 30 0 60 120 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER

DESIGNED BY: Parsons ES	Pelham Range Anniston, Alabama		
DRAWN BY: Parsons ES			
CHECKED BY: Parsons ES	SCALE: 1 inch equals 60 feet	PROJECT NUMBER: 740323	
SUBMITTED BY: Parsons ES	DATE: February 2002	PAGE NUMBER: 1	
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Figure 1.6

Old Water Hole
SAIC Geophysical Survey
Magnetic Field Intensity

Legend

- Anomaly to be Investigated
- Estimated Depression
- Road
- Elevation Contour (2 ft interval)

51950

Magnetometer Response
Total Magnetic Field Intensity

51920

nT

60 30 0 60 120 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER

DESIGNED BY: Parsons ES	Pelham Range Anniston, Alabama		
DRAWN BY: Parsons ES		SCALE: 1 inch equals 60 feet	PROJECT NUMBER: 740323
CHECKED BY: Parsons ES		DATE: February 2002	PAGE NUMBER: 1
SUBMITTED BY: Parsons ES		FILE: x:\gis\740323\maps\ Fig_1_6_geophys.mxd	

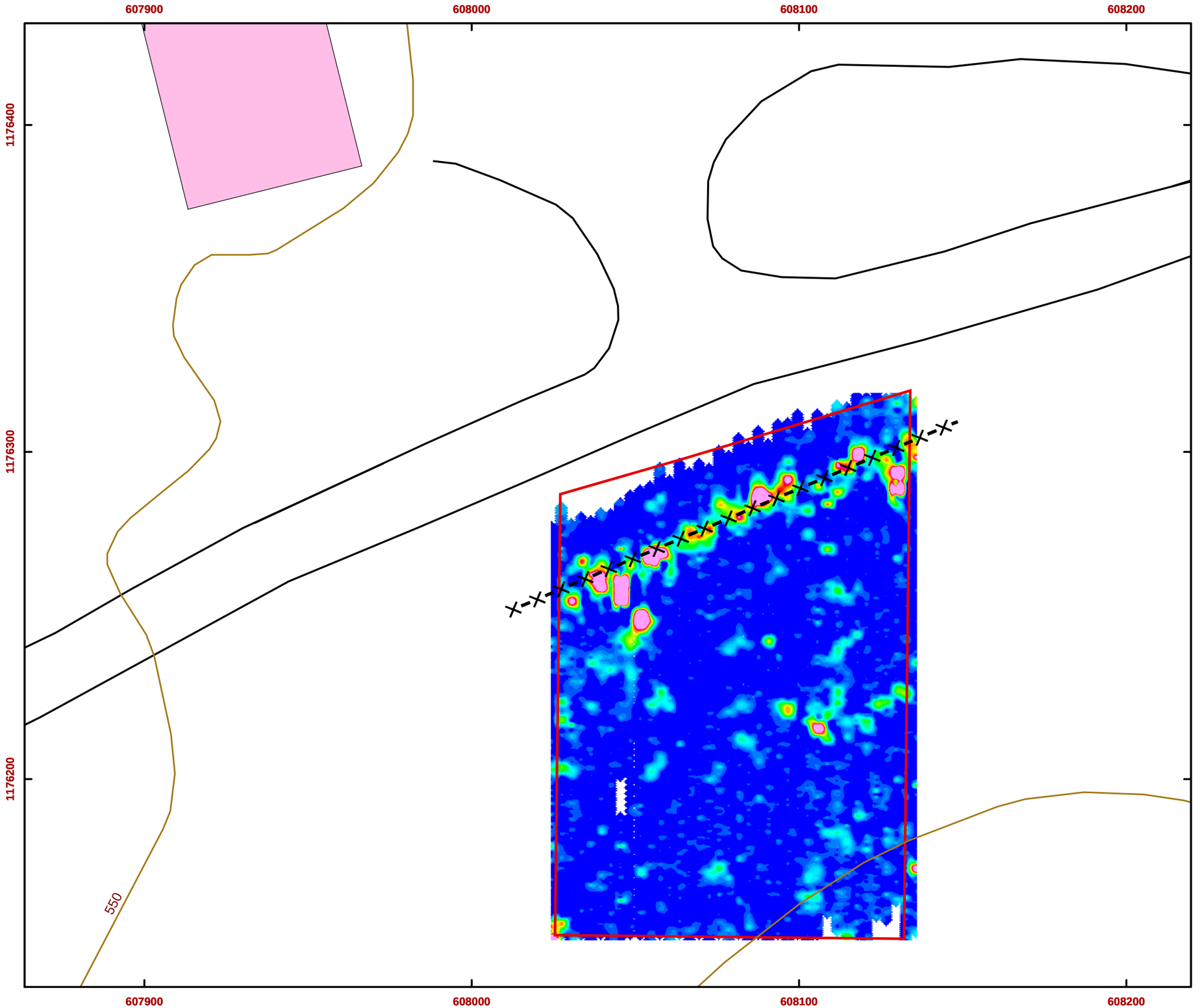


Figure 1.7

Former Decon Area

EM61 Bottom Coil Data

Legend

- Road
- 550 Foot Contour
- Former Fence Line
- Former Decon Area
- Rideout Hall

50

0

mV

Metal Detector Response
EM61 - Bottom Coil

N

Note:
Geophysical anomalies are discussed in section 4.4.4.

0 15 30 60 90 Feet

Coordinate System: State Plane, NAD 1983, Alabama East, Feet

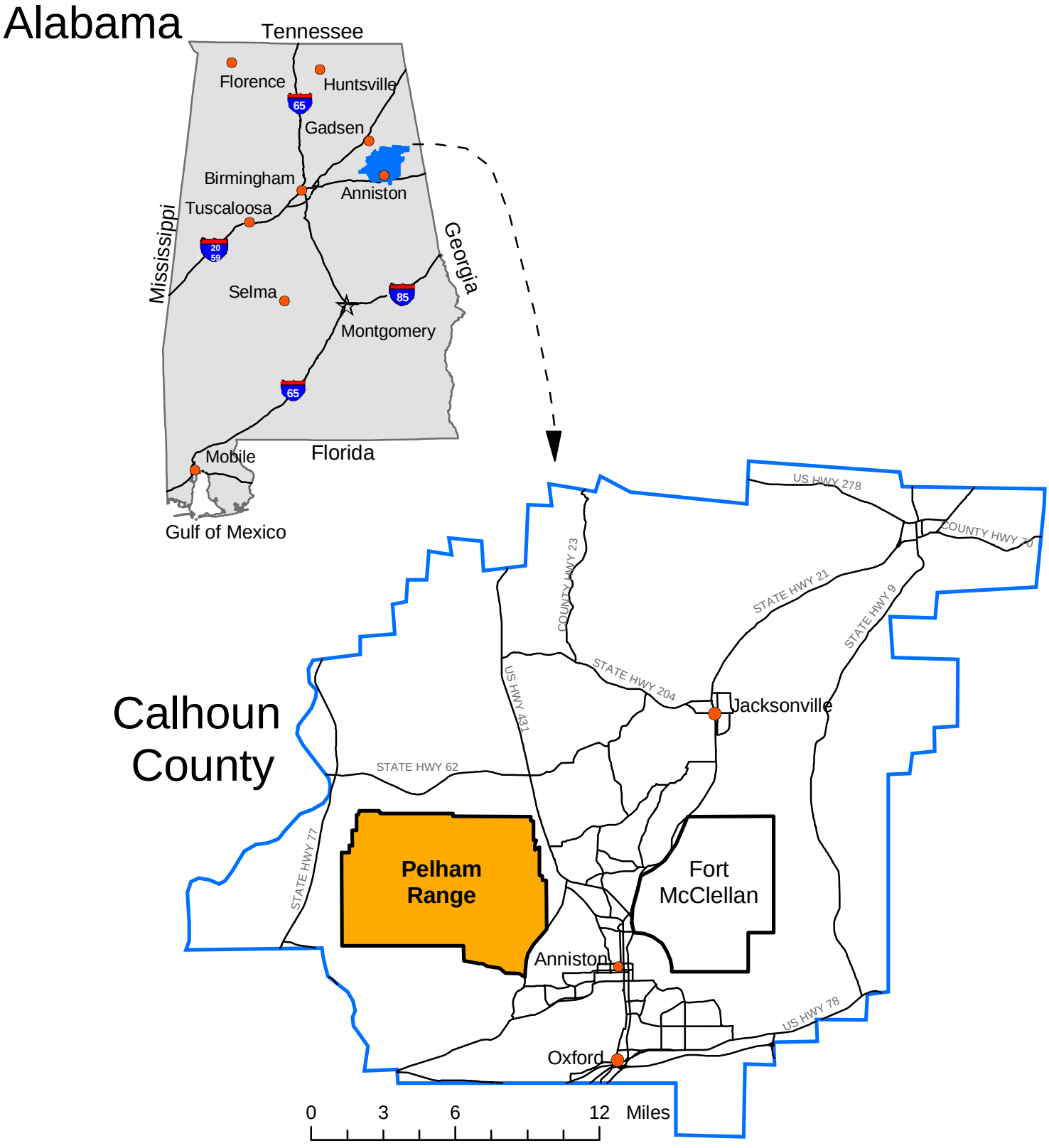
PARSONS

U.S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE

DESIGNED BY: MJBE	Figure 1.7 - Former Decon Area EM61 Bottom Coil Data
DRAWN BY: MJBE	
CHECKED BY: JAC	SCALE: 1 inch Equals 30 Feet
SUBMITTED BY: JAC	DATE: August 2002
	FILE: x:\gis\740323\maps\site_ invest_report\figure3_4.mxd
	PROJECT NUMBER: 741671
	PAGE NUMBER: 3-11

SECTION 2.0
WORK, DATA, AND COST MANAGEMENT PLAN

See Section 2.0 of the Volume I, Final Site Safety Submission (September 2000) for the Work, Data and Cost Management Plan. The anticipated schedule for work related to the Pelham Range sites is provided as Figure 2.1 and a distribution list for this amendment is provided in Table 2.2.



Legend

- Alabama Cities
- Calhoun County Boundary
- Roads

N

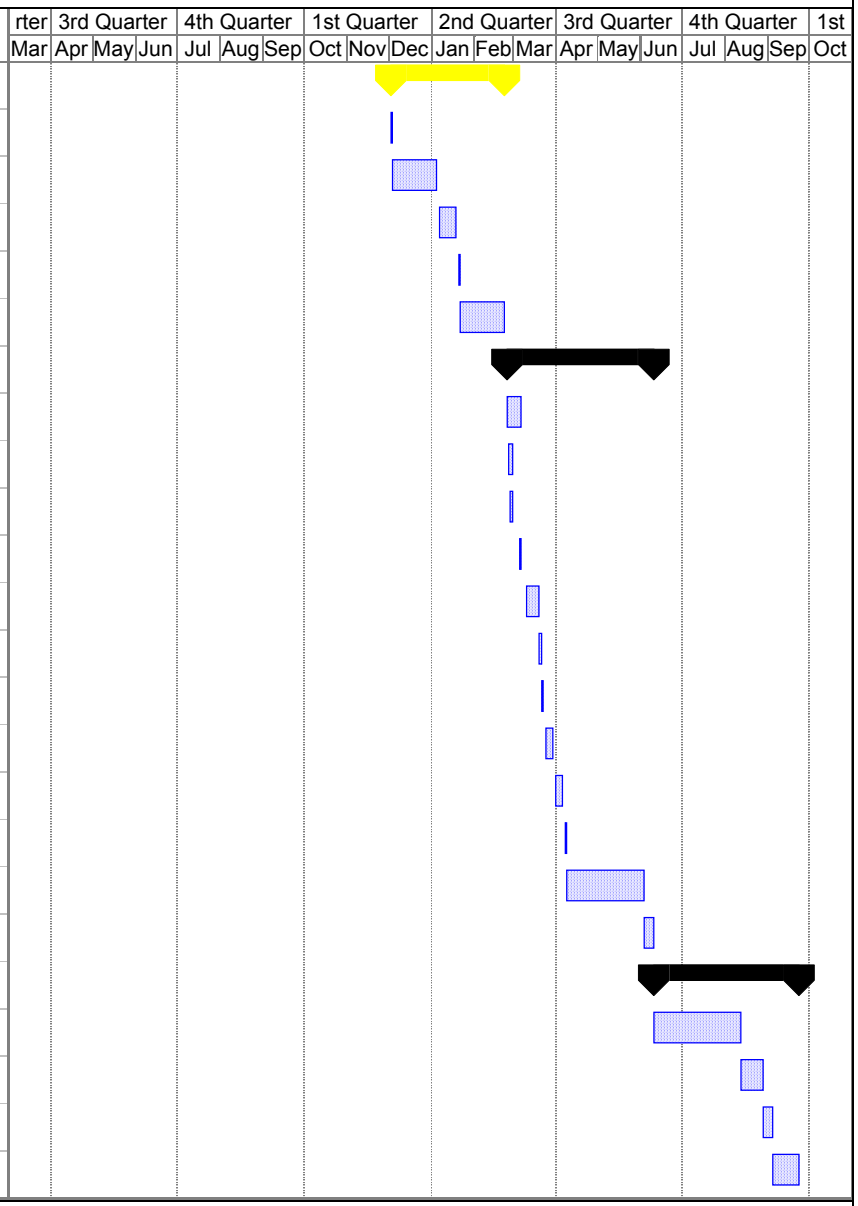
Pelham Range Site Location Map

Figure 2.1

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
DESIGNED BY: RED	PELHAM RANGE ANNISTON, ALABAMA CALHOUN COUNTY
DRAWN BY: RED	
CHECKED BY: RLS	SCALE:
SUBMITTED BY: RLS	PROJECT NUMBER: 740323
DATE: December 2001	PAGE NUMBER:
FILE: X:\gis\740323\maps\Fig1_1_Locatordata\Locator2_1.mxd	

Figure 2.1 Pelham Range Schedule

ID	Task Name	Duration	Start	Finish
1	**Plans (DACA87-D-95-0018 TO 29)**	**60 days**	**Mon 12/3/01**	**Fri 2/22/02**
2	Draft Final SS Amendment	1 day	Mon 12/3/01	Mon 12/3/01
3	REG/USATCES Review	24 days	Tue 12/4/01	Fri 1/4/02
4	Incorporate Comments	10 days	Mon 1/7/02	Fri 1/18/02
5	Final SS Amendment	1 day	Mon 1/21/02	Mon 1/21/02
6	USATCES/DA/TRADOC Review	24 days	Tue 1/22/02	Fri 2/22/02
7	**Field Work**	**76 days**	**Mon 2/25/02**	**Mon 6/10/02**
8	Parsons Mobilization	8 days	Mon 2/25/02	Wed 3/6/02
9	Brush Clearing	3 days	Tue 2/26/02	Thu 2/28/02
10	Geophysical Survey	2 days	Wed 2/27/02	Thu 2/28/02
11	Reacquisition of Anomalies & Team Mobilization	1 day	Wed 3/6/02	Wed 3/6/02
12	Personnel Training	7 days	Mon 3/11/02	Tue 3/19/02
13	CEHNC Survey	2 days	Wed 3/20/02	Thu 3/21/02
14	Table Top	1 day	Fri 3/22/02	Fri 3/22/02
15	DA Pre-Op	5 days	Mon 3/25/02	Fri 3/29/02
16	Correction Period	5 days	Mon 4/1/02	Fri 4/5/02
17	Approval for intrusive work	1 day	Mon 4/8/02	Mon 4/8/02
18	Start Intrusive Work	40 days	Tue 4/9/02	Mon 6/3/02
19	Demob	5 days	Tue 6/4/02	Mon 6/10/02
20	**SI Report**	**75 days**	**Tue 6/11/02**	**Mon 9/23/02**
21	Draft SI Report	45 days	Tue 6/11/02	Mon 8/12/02
22	Review of Draft SI Report	12 days	Tue 8/13/02	Wed 8/28/02
23	Respond to Comments	5 days	Thu 8/29/02	Wed 9/4/02
24	Final SI Report	13 days	Thu 9/5/02	Mon 9/23/02



Project: Figure2.1.mpp
Date: Thu 1/15/04
Page 1 of 1

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
External Milestone
Deadline

Table 2.2
Distribution List

Addressee	Site Safety Submission	
	Draft Final	**Final**
Commander US Army Engineering and Support Center, Huntsville ATTN: CEHNC-OE-DC (Mr. D. Copeland) PO Box 1600 4820 University Square Huntsville, AL 35816-1822	6	6
U.S. Army Garrison Command ATTN: ATZN-EM (Lisa Holstein) 291 Jimmy Parks Blvd. Fort McClellan, AL 36205-5000	6	6
Commander US Army Engineer District, Mobile ATTN: CESAM-PM-TA (Mr. Ellis Pope) 109 Saint Joseph Street Mobile, AL 36602 PO Box 2288 Mobile, AL 36628-0001	4	4
Jim Patton Department of Army 200 Army Pentagon Washington, D.C. 20310-0200	1*	1*
Defense Ammo Center U.S. Army Technical Center for Explosives Safety ATTN: SIOAC-ESM 1 C Tree Road, Bldg. 35 McAlester, OK 74501-9053	3*	3*
Sam Testerman ATTN: CESO 20 Massachusetts Avenue, NW Washington, D.C. 20314-3660		*L
USASBCCOM (ECBC) ATTN: AMSSB-RCB-C (Mr. John Ditillo) 5183 Blackhawk Road, Bldg. E 3942 Aberdeen Proving Ground, MD 21010-5424	3	3
SBCCOM Risk Management ATTN: AMSSB-ISR (Mr. Cliff Wendel & Dr. Mukai) 5183 Blackhawk Road, Bldg. E5101 Aberdeen Proving Ground, MD 21010-5424	1	1

Addressee	Site Safety Submission	
	Draft Final	**Final**
Program Manager for Chemical Demilitarization, Product Manager, Non-stockpile Chemical Materiel ATTN: SFAE-CD-NM (Mr. Tom Hoff) Bldg. E4405 Aberdeen Proving Ground, MD 21010-4405	4	4
Commander Technical Escort Unit ATTN: AMSSB-OTE-BCO (Michael Rehmert) 5232 Fleming Road Aberdeen Proving Ground, MD 21010-5423	4	4
U.S. Environmental Protection Agency Waste Management Division, FFB/DODRS ATTN: Mr. Doyle Brittain 61 Forsyth Street, SW Atlanta, GA 30303	1	1
Gannett Fleming, Inc. ATTN: Hugh Vick Peachtree Center Tower, Suite 2750 230 Peachtree Street, NW Atlanta, GA 30303	1	1
Alabama Department of Environmental Management Government Facilities Section, Hazardous Waste Branch, Land Division ATTN: Mr. Phillip Stroud 1400 Coliseum Boulevard Montgomery, AL 36110-2059 *P.O. Box 301463* *Montgomery, AL 36130-1463*	2	2
LTC David McPherson FMARNG Training Site P.O. Box 5280 Fort McClellan, AL 36205	1	1
Installation Restoration Program NGB-ARE-IRP Branch ATTN: JoAnn S. Watson Building E4430 Aberdeen Proving Ground, MD 21010-5420	1	1
State Military Department Alabama Army National Guard Environmental Program Manager ATTN: Major Wayne A. Sartwell 1720 Dickinson Drive Montgomery, AL 36109-0711	1	1

Addressee	Site Safety Submission	
	Draft Final	**Final**
Dr. Larry Lumeh C. C. Johnson & Maholtra, P.C. 9115 Gilford Road, Suite 100 Columbia, MD 21046	1	1

Notes:

* - Copy via USAESCH

*L – Letter to be submitted by USAESCH

SECTION 3.0
INTRUSIVE EXCAVATION PLAN

- The procedures for conducting intrusive operations at Pelham Range are contained in Section 3 of Volume I of the Final Site Safety Submission (September 2000). For Pelham Range, the following changes to the Intrusive Excavation Plan are needed:
- No magazine set-up will be required since donor explosives will be provided on an on-call basis by a licensed vendor.
- Dewatering procedures in Section 3.5.4 are expanded to include pumping water from around the anomaly to adjacent areas to temporarily dewater the area to be excavated without using a storage tank.

SECTION 4.0
CHEMICAL DATA QUALITY MANAGEMENT AND FIELD SAMPLING PLAN

See Section 4 of Volume I of the Final Site Safety Submission (September 2000) for the discussion of the Chemical Data Quality Management and Field Sampling Plan. Sections with information specific to Pelham Range are provided below.

4.3 PROJECT ORGANIZATION AND DATA QUALITY MANAGEMENT RESPONSIBILITIES

4.3.1 Organizational responsibilities for the overall project are outlined in Section 1.4. Specific roles with regard to field data collection and analytical data quality are listed below.

4.3.2 Project Manager – Joseph Cudney, Parsons, Atlanta, Georgia

Overall responsibility for development and implementation of project plans, including the objectives for field sampling, locations and guidelines of samples to be obtained, and analyses to be conducted.

4.3.3 Site Manager – Jeffrey Ulmer, Parsons, Atlanta, Georgia

Responsible for field implementation of the sampling plans and protocols, ensuring the objectives of sampling are attained and providing coordination and tracking of the screening and definitive data to be developed.

4.3.4 Analytical QA/QC Officer - Laura Kelley, Parsons, Atlanta, Georgia

Responsible for the development of the analytical quality assurance plans and implementation of data validation and reporting.

Revised Table 4.2 shows the specific field samples and analyses for the Pelham Range sites. Quantities shown are the minimum anticipated based on planned soil sampling. Additional soil samples will be obtained if CWM or suspect materials are located within the excavations. Also, 10% additional duplicate samples will be taken for QC purposes.

Table 4.2 Field Samples and Analyses

Site/Activity	Site Designation	Matrix	Analyses **			
			Quantity	Agents/ Degradation Products	Volatile Organic Screening	TCLP
Lima Pond (Range L)	Lima Pond	Water	6	X		
		Sediment	6	X		
Old Water Hole	Old Water Hole	Soil	4	X		
		Water	TBD	X		
Former Decon Area	Former Decon Area	Soil	24	X		
IDW	IDW	Water	TBD	X		X
		Sludge	TBD	X		X
		Soil	TBD	X		X
All Sites		Air	TBD	X	X	

** Analytical suites as follows:

Chemical Agent (ECBC - MINICAMS®/DAAMS/FTIR/Laboratory)

Mustard (HD), thiodiglycol, 1,4-oxathiane, 1,3-dithiane

Lewisite (L), Lewisite oxide, chlorovinyl arsenious acid

Sarin (GB)

TCLP – Methods SW1311, 8260, 8270, 8080, 8150, 6010

Semi-volatile organics pesticides/PCBs metals

Volatile organics herbicides

On-site Organic Vapor Analyses

Surface water and sediment samples collected at Lima Pond will be screened and analyzed for chemical agent (HD, and L)

SECTION 5.0
SITE SPECIFIC GEOPHYSICAL INVESTIGATION PLAN

5.1 INTRODUCTION

The general geophysical investigation procedures are outlined in Section 5.0 of Volume I of the Final Site Safety Submission (September 2000). This section of the Amendment addresses the Pelham Range site-specific geophysical investigation procedures. This section describes the geophysical surveys to be performed at the Former Decon Area. Geophysical investigations at the other two Pelham Range sites will be limited to reacquisition of anomalies using the EM61.

5.2 GEOPHYSICAL INVESTIGATION PROCEDURES

The geophysical procedures will remain the same as for the Fort McClellan EE/CA except that the prove-out grids used for that investigation are no longer available. Instead, a temporary test plot will be established to verify proper instrument operation and data repeatability. The test plot will be established at some convenient location near the Former Decon Area. It will be at least 100 ft long and have at least 3 test items (to be placed at the surface). The test plot will remain in place during geophysical mapping.

5.3 FORMER DECON AREA GEOPHYSICAL SURVEYS

5.3.1 Background

The Former Decontamination Area South of Toxic Gas Area is a gently sloping, wooded hillside that was reportedly used for decontamination training with live chemical agent. A full description can be found in Section 1.4.1 of this Amendment.

5.3.2 Previous Geophysical Studies

No previous geophysical surveys were conducted at the Former Decon Area.

5.3.3 Planned Geophysical Survey

A geophysical survey will be conducted over the entire area of Parcel 207(7)HR, which is about 100 feet by 150 feet. Both the EM61 metal detector and the G-858 magnetometer will be used to map the parcel. A two-foot line spacing will be used for the G-858 and a three-foot line spacing for the EM61.

5.4 GEOPHYSICAL SURVEY EQUIPMENT

See Section 5.4 of Volume I of the Final Site Safety Submission for a description of the geophysical survey equipment.

SECTION 6.0
ENVIRONMENTAL PROTECTION PLAN

The Environmental Protection Plan is found in Section 6.0 of Volume I of the Final Site Safety Submission (September 2000). The SAIC Remedial Investigation Report (SAIC, 2000) summarized the flora and fauna and determined that no protected species or critical habitats are present on the sites under investigation. No biological field reconnaissance will be conducted for the Pelham Range sites. Intrusive investigations into wetland areas such as Lima Pond and the Old Water Hole will be kept to the smallest size necessary to meet project objectives and to minimize the impact on the wetlands.

SECTION 7.0
CONVENTIONAL ORDNANCE HANDLING PLAN

7.1 GENERAL

This plan outlines the procedures to be used to perform conventional ordnance detection, removal, and disposal operations in the event that such items are found at the sites to be investigated at Pelham Range, Alabama. The UXO Contractor will dispose of conventional ordnance located on site by detonation. Conventional ordnance encountered during intrusive operations, if determined to be safe to move (unfuzed), will be detonated at the conclusion of each day's operations. Storage of explosives will be in accordance with DOD 6055.9 STD and AR 385-64 and will comply with compatibility requirements. Conventional ordnance items determined unsafe to move will be detonated in place.

7.2 DISPOSAL OPERATIONS

7.2.1 All conventional ordnance material containing explosives will be disposed of by detonation utilizing standard electric firing procedures as outlined in Technical Manual (TM) 60A-1-1-31. The UXO Contractor will have the option to utilize non-electric firing procedures if the particular situation dictates. If these methods of disposal are determined to be impractical, the on-site USAESCH Safety Specialist will be notified. The proposed disposal site will be located in the range impact area and will be determined in coordination with the Pelham Range Control and the USAESCH Safety Specialist. All demolition shots net explosive weight (NET) will be within the designated range's NET. The location of the disposal area will provide the greatest possible separation from inhabited buildings and public highways. The following paragraphs describe the procedures to be used to detonate conventional ordnance items at Pelham Range.

7.2.2 All conventional ordnance excavated will be destroyed on the same day as excavation. Demolition operations will begin in the disposal site when all non-essential and non-UXO personnel are out of the fragmentation zone and the K328 withdrawal distance of the ordnance being detonated. The K328 distance, also known as the Temporary Threshold Shift Distance, is computed using Kingery curve equations. K328 corresponds to a pressure level of 0.065 psi and is the distance used for public withdrawal distance from intentional detonations. Conventional ordnance will be consolidated where possible to reduce the number of shots.

7.2.3 The SUXOS and SSO will be onsite at all times during disposal operations. The operation will be performed under the direction and supervision of the

SUXOS, who is charged with the responsibility to ensure that procedures contained in this plan and referenced documents are followed. The SSO will monitor compliance with the safety measures contained in the work plan and associated documents, and in the event of non-compliance, is vested with the authority to stop or suspend operations.

7.2.4 Prior to the start of disposal activities, the SUXOS and SSO will verify that the area around the disposal site is clear of all non-UXO personnel. A minimum distance of 1,955 feet will be established and maintained around the operating site. Depending on the type of munitions being destroyed, the fragmentation distance may be increased or decreased based on data obtained from USAESCH, in accordance with HNC-ED-CS-S-98-1: Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives. Personnel remaining on-site will be limited to those personnel needed to safely and efficiently prepare the item(s) of destruction.

7.3 EQUIPMENT

Standard electric or non-electric demolition equipment as used by the U.S. Army Corps of Engineers will be used. Procedures will follow the guidelines dictated by TM 60A-1-1-31.

7.4 EVACUATION AND SITE CONTROL

Prior to initiation of demolition operations, all non-essential personnel will be evacuated to a minimum distance of 1,955 feet. Prior to priming of demolition charges, all avenues of ingress will be physically blocked. Notifications to the FAA and any local notifications will be made. Radio communications will be maintained between all concerned parties at all times. Avenues of ingress will not be opened without the express permission of the SSO. A constant state of vigilance must be maintained by all personnel to detect any intrusion into the fragmentation zone.

7.5 EXPLOSIVES ACCOUNTABILITY, STORAGE & TRANSPORTATION

Explosives for demolition will be provided to the project on an on-call basis by a commercial vendor. No on-site storage will be required. Detailed procedures for the issue, use and turn-in of explosives are contained in Attachment 1 to Section 7 of Volume I of the Final Site Safety Submission. Attachment 2 contains an "Explosives Storage and Accountability" SOP, and Attachment 3, contains an "Ammunition and Explosives Transportation" SOP. Section 3-2 of Attachment 3 contains the procedures for the transportation of explosives offsite including placarding and compliance with applicable rules and regulations that will be required if explosive demolition operations are required. In addition to these procedures, the following will be strictly enforced:

- Issues of explosives will be limited to those quantities needed to perform a specific operation.
- Strict accountability of explosives will be maintained at all times.

- Only UXO Technicians will be issued and/or transport explosive materials.
- All vehicles transporting ammunition and explosives will be properly inspected prior to loading explosives onto the vehicle.
- Vehicle engine will not be running when loading or unloading explosives.
- Beds of vehicles will have either a wooden bed liner, dunnage, or sandbags to protect the explosives from contact with the metal bed and fittings.
- Vehicles transporting explosives will have a first aid kit, two (2) 10 BC fire extinguishers and communications capability.
- Compatibility requirements when transporting explosives and UXO will be observed.
- Vehicle operator will have a valid operators permit.
- Personnel will not ride in the cargo compartment with explosives or conventional ordnance.

7.6 DISPOSAL SHOTS

7.6.1 While preparing conventional ordnance for detonation, the SUXOS and SSO will ensure that the number of personnel on-site is kept to a minimum required to safely accomplish the disposal mission. Authority to initiate demolition operations will rest solely on the SUXOS. This individual is responsible for ensuring that all personnel have been evacuated from the area, that all personnel have been accounted for, that all pertinent parties have been notified of an impending demolition shot and that the area is secure prior to authorizing the detonation of explosive charges. Prior to priming demolition shots, the field team's UXO Supervisor will direct all non-essential personnel except the SSO and the USAESCH Safety Specialist to leave the area.

7.6.2 Upon completion of disposal operations, the Senior UXO Supervisor and one UXO Technician will visually inspect each disposal shot. One of these personnel will perform a visual inspection of the disposal site(s). The second person will standby at a safe distance and be prepared to render assistance in the event of an emergency. Upon completion of this inspection and providing that there are no residual hazards, the SUXOS will authorize the resumption of site operations.

7.7 DISPOSAL PROCEDURES

The procedures contained in TM 60A-1-1-31 and the SOP (see Attachment 1 to Section 7 of Volume I of the Final Site Safety Submission) will be used to dispose of UXO. Conventional ordnance will be disposed of by detonation. More detailed procedures for preparation of demolition firing trains, firing of demolition charges, and post operation procedures are contained in the Disposal/Demolition Operations SOP.

SECTION 8.0
INVESTIGATION DERIVED WASTE AND SCRAP MONITORING AND DISPOSAL PLAN

- The Investigation Derived Waste and Scrap Monitoring and Disposal Plan are found in Section 8.0 of Volume I of the Final Site Safety Submission (September 2000). Information specific to Pelham Range are described below:
- For Pelham Range, scrap and investigation derived wastes will be staged to an area near the command post (see Section 9.0 for a description of the command post).
- Gray waters generated from equipment and personnel decontamination will be collected, transported and disposed into the Fort McClellan sanitary sewer. Permission will be obtained from the Anniston Sewer and Water Board prior to dumping and any procedures required by the board will be followed. In the past, sampling the waters for chlorine content was required. If permission is not granted water will transported for off-site treatment and disposal.

SECTION 9.0
MOBILIZATION AND DEMOBILIZATION PLAN

This section discusses the logistics of mobilizing personnel and equipment to the site, maintaining a field office at the site, and moving personnel and equipment off the site at the conclusion of the field investigation.

9.1 ORGANIZATIONS

Several organizations have significant responsibilities during the field investigation and will require use of site facilities. The primary organizations are:

- Parsons Engineering Science (and subcontractors);
- U.S. Army Corps of Engineers, Huntsville Center (USAESCH);
- U.S. Army Corps of Engineers, Mobile District (CESAM);
- U.S. Army Technical Escort Unit (TEU);
- U.S. Army Edgewood Chemical Biological Center (ECBC); and
- Alabama Army National Guard.

9.2 RESPONSIBILITIES OF PERSONNEL

Prior to the mobilization of the full work crew, Parsons ES will mobilize an Advance Party to facilitate appropriate logistical coordination to support the work crew. The Advance Party's goal is to set up site facilities (field office, communications, utilities, etc.), verify emergency services (routes, telephone numbers, etc.), and begin locating grids for geophysical surveys and brush cutting. At a minimum, this Advance Party will consist of the following personnel:

- Parsons ES Project Manager;
- Parsons ES Site Manager;
- Senior UXO Supervisor;
- Site Safety Officer; and
- UXO Safety Officer

9.2.1 Parsons ES Project Manager

The Parsons ES Project Manager is responsible for overall project activities, including schedule and budget control, coordinating field personnel, securing subcontractor support, and obtaining technical reviews of project deliverables. As part of

the Advance Party, the Project Manager will assure that the requirements of the Work Plan are being met and that adequate and appropriate personnel are available for conducting the work.

9.2.2 On-Site Project Manager

The Parsons ES Site Manager is responsible for the overall completion of site operations and will direct the routine daily activities of the Advance Party. The Site Manager will assure that the field office is fully equipped and functional and that all field investigation equipment is available and ready for use by the field team.

9.2.3 Senior UXO Supervisor

The Senior UXO Supervisor will direct the daily actions of the ordnance specialists and will be responsible for obtaining the equipment and supplies needed for performance of ordnance-related activities. The Senior UXO Supervisor will coordinate transportation and lodging arrangements for the ordnance specialists.

9.2.4 Site Safety Officer

The Site Safety Officer (SSO) will provide daily safety briefings to all Advance Party personnel working in potential ordnance areas. The SSO will review safety procedures of the survey team and will conduct periodic inspections to insure compliance of the survey team with health and safety requirements. During the Advance Party operations, the SSO will coordinate preoperational checks of emergency services and evacuation procedures, and will assure that needed health and safety equipment is available for use by the field team.

9.3 ESTABLISHING PROJECT FACILITIES

9.3.1 Command Post

9.3.1.1 Parsons ES will establish a primary command post in Building 8507 at the T60 area near the Interim Holding Facility (IHF). Parsons ES and its subcontractors as well as government agencies (USAESCH, TEU, ECBC) will have the use of the office space.

9.3.1.2 The Advance Party will prepare the primary command post by performing the following tasks:

- Erect a gated fence around the IHF and scrap storage area;
- Arrange for the delivery of and the placement of the IHF and storage containers;
- Arrange for the electrical hookup of the building and IHF;
- Arrange for telephone hookups;
- Arrange for delivery and placement of portable toilets.

9.3.2 Explosives Storage Area

- No explosives will be stored on site.

9.3.3 CWM Scrap Collection Point

The Advance Party will prepare a storage pad for the containerized CWM scrap collection point. The necessary tasks include:

- Erecting a perimeter chain-link fence that includes a locked access gate and
- Provide appropriate signage.

9.3.4 Equipment Storage Facilities

A locking storage trailer will be placed within the fenced area of the primary command post. If necessary, a smaller trailer that can be towed behind a field vehicle will be used to store equipment at individual investigation areas.

9.3.5 Utilities

The Advance Party will facilitate the hook-up of the required utilities.

9.3.5.1 Electrical

The office building located at the primary command post will require electrical services. An electrician will be hired to install junction boxes on temporary utility poles, then the electric utility will be contacted to provide power to the poles.

9.3.5.2 Water

Bottled water will be provided at the primary command posts for drinking use. A bladder or polyethylene tank will be used to haul water to the investigation areas for use in decon and showering. Arrangements will be made with Alabama National Guard for obtaining the bulk water from a hydrant located near the site.

9.3.5.3 Sanitation

Two portable toilets will be placed at the primary command post. One or more portable toilets (depending on the number of field personnel) may need to be placed at each investigation area prior to beginning work at each area.

9.3.5.4 Telephone

The command post will require telephone services. The Advance Party will coordinate the connection of these services (to include facsimile capability).

9.3.6 Communications

9.3.6.1 The communications system used for internal on-site use will be the Motorola HT 1000 radio, or equivalent. This equipment will be made available for all on-site personnel as well as USAESCH representatives.

9.3.6.2 Each office in the primary command post will be equipped with commercial telephone service if possible. Two voice lines and one fax line will be provided. The mobile command post trailer will be equipped with a cellular telephone.

9.3.7 Decontamination

Decontamination will be conducted on both personnel and equipment. Personnel decontamination areas will be set up on each site prior to commencement of specific site activities. Mobilization activities will include the acquisition of materials necessary to set up the decontamination line in accordance with Volume II of the Final Site Safety Submission. A shower facility will be provided for personnel decontamination. Depending on the planned activity and duration at each site, the shower facility may be kept at the "command post" area moved the site being investigated. Equipment decontamination will occur on each site using a temporary decontamination area to be constructed on the site. Details for development of this decontamination area are outlined in Volume II of the Final Site Safety Submission. Materials to construct these facilities will be purchased during site mobilization.

9.4 EQUIPMENT ACQUISITION

9.4.1 Vehicles/Heavy Equipment

The Advance Party will coordinate the delivery or pick up of rental vehicles and heavy equipment and will establish a logbook for each vehicle and piece of heavy equipment

9.4.2 Government Furnished Equipment (GFE)

The Advance Party will conduct an inventory of government-furnished equipment (GFE). Any noted discrepancies will be immediately reported to USAESCH. A Government Property Tracking Log will then be initiated.

9.5 ESTABLISHING WORK AREAS

To ensure the integrity of the work sites, the Advance Party will inspect for the integrity of site fences and gates in order to segregate grazing cattle or public access from the work areas. If necessary, additional fencing and/or gates will be constructed.

9.5.1 Brush Clearance

Parsons will conduct the necessary brush clearance in order to conduct the required operations. The Advance Party will identify any necessary brush clearance operations; upon mobilization of the main body, the clearance will be performed.

9.5.2 Exclusion Zones

The Advance Party, in conjunction with the other organizations listed in Section 1, will establish exclusion zones for each of the work sites. The Advance Party will also spot numerous streamers throughout the work sites to aid personnel in determining wind direction and relative speed.

SECTION 10.0
QUALITY CONTROL PLAN

Section 10.0 of Volume I of the Final Site Safety Submission (September 2000) contains the Quality Control Plan. Section 10.11.4, which contains Pelham Range information, was changed as follows:

10.11.4 Field Office/Communications

Field QC procedures will include establishing field office entry requirements and communication protocols. A field office will be established within the property boundaries of Pelham Range. All official visitors will report to the project field office to sign in. No one will be allowed to visit any portion of the site without an escort. All visitors will be announced to the site via a two-way radio if the visitors are touring the actual site work areas. All internal communications will be by use of Motorola MTX portable and base station equipment, or equivalent. All official external communications shall be via cellular telephone or land line from the field office.

APPENDIX A

SCOPE OF WORK

APPENDIX B

RESERVED FOR COMMENTS AND RESPONSES

APPENDIX C

RESUMES OF KEY PERSONNEL [See below and Appendix C of Volume I of the Final Site Safety Submission (September 2000)]

APPENDIX D

GLOSSARY [See Appendix D of Volume I of the Final Site Safety Submission (September 2000)]

APPENDIX E

EXPLOSIVE SITING PLAN

1.0 INTRODUCTION

This Explosives Siting Plan outlines the ordnance safety aspects of the field investigation of the CWM SI at Pelham Range. This appendix addresses those sites to be investigated for the presence of CWM and identifies those at which conventional unexploded ordnance (UXO) may be encountered. All activities involving work in those sites potentially containing unexploded ordnance will be conducted in full compliance with U.S. Army Engineering and Support Center, Huntsville (USAESCH), U.S. Army Corps of Engineers (USACE), Department of the Army (DA) and Department of Defense (DOD) requirements regarding personnel, equipment, and procedures.

2.0 REASON FOR ORDNANCE AND EXPLOSIVES (OE)

Three sites are being investigated at Pelham Range. The following summarizes the basis for potentially encountering ordnance during the investigation:

2.1 Lima Pond

2.1.1 Lima Pond was a station on the Chemical, Biological and Radiological Tactical Training Exercise course used to simulate an atomic bomb crater. In addition to training with radioactive sources, Lima Pond was reportedly used for training with floating smoke pots, for burial of captured World War II munitions including CWM, and other unknown disposal. The ASR reported that there was no record of captured munitions ever being sent to Fort McClellan (USACE, 2001).

2.1.2 There is no specific mention of ordnance items used at Lima Pond. However, Lima Pond is partly within the safety range fan for an inactive 12,000-ft 'tank' range used in 1944 (ESE, 1998). Typical munitions used in tank training exercises during that era included up to a 90 mm projectile. A 90mm projectile is the MPM based on the location of this site relative to the location of the tank safety range fan.

2.2 Old Water Hole

2.2.1 The Old Water Hole is within Training Area 5C. The Installation Assessment for Fort McClellan, Report No. 110, Volume I of II (USATHAMA, 1977) reported that the Old Water Hole was thought to be a "disposal site for just about everything". Expended slap flares were observed at the Old Water Hole during the ASR site visit (USACE, 2001).

2.2.2 There is no specific documentation of ordnance items used at the Old Water Hole. The Old Water Hole is not located within any historical or current firing range fans. The Old Water Hole is located approximately 1000 meters beyond the northeast extent of the safety range fan of Multipurpose Familiarization Range 51 (154Q-X). There are no other conventional ranges located nearby. No MPM is applicable for this site.

2.3 Former Decon Area

2.3.1 Decontamination training was conducted at the Former Decon Area and reportedly involved pouring one gallon of mustard onto the ground and decontaminating the area with super tropical bleach (STB). This site is possibly a burial site for excess mustard agent remaining from those decontamination exercises.

2.3.2 There is no specific mention of ordnance items used at this site. However, the Former Decon Area is located within the safety range fan for an inactive 12,000-ft 'tank' range used in 1944 (Reference: Environmental Baseline Study (ESE, 1998)). Typical munitions used in tank training exercises during that era included up to a 90 mm projectile. A 90mm projectile is the MPM based on the location of this site relative to the location of the tank safety range fan.

3.0 EXPECTED AMOUNT AND TYPE OF ORDNANCE & EXPLOSIVES (OE)

The most probable munition (MPM) for each of the sites will be the conventional unexploded ordnance item causing the worst scenario. However, if a conventional UXO with a greater fragmentation distance is found, the Quantity/Distance arcs will be adjusted and an amendment to the submission will be submitted for approval. Until a new Q/D is established and approved, the distance specified in DOD 6055.9-STD will be used.

- **Lima Pond** – the MPM for this site is a 90 mm projectile.
- **Old Water Hole** – No MPM required for this site.
- **Former Decontamination Area** – the MPM for this site is a 90 mm projectile.

4.0 START DATE

Figure 2.1 in the main part of the Amendment shows the project schedule.

5.0 FROST LINE

The maximum frost line depth for this area is approximately three inches (Source: U.S. Department of Commerce Weather Bureau Chart). The investigated action for this project is a surface/subsurface investigation to a depth of at least four feet. Therefore frost heave will not be a factor for the project areas.

6.0 CLEARANCE TECHNIQUES

This section presents information concerning detection, excavation, identification and disposal of any unexploded ordnance encountered during intrusive investigation at the sites. It includes a discussion of the method of detection, capabilities/limitations of the method, quality assurance/quality control (QA/QC) standards, processes to determine that OE scrap contain no explosive or chemical agent hazards, and disposition of the OE scrap removed from the site or generated during the site investigation.

6.1 Capabilities and Limitations of the Detection Methods

The geophysical instruments for mapping subsurface anomalies at the Pelham Range sites are the EM61 and the G-858 magnetometer. Both instruments are capable of detecting burial sites, such as those that are the targets of this site investigation, at depths greater than five feet.

6.2 Detection and Removal Procedures

6.2.1 Prior to the intrusive investigation, dig sheets will be prepared and anomalies will be reacquired using the same type instrument used for mapping and marked with stakes or flags.

6.2.2 Using the dig sheets, the UXO Team will excavate each of the selected target anomalies. Site-specific conditions (e.g., a larger size ordnance item found than was anticipated) may warrant modification of EZ distances and removal procedures described herein. As necessary, any changes will be prepared and submitted separately for approval prior to initiation of further activities on-site.

6.2.3 Excavations will be conducted by two- or three-man UXO teams equipped with magnetometers to assist the team in determining the location and orientation of the target item. The depth, orientation, and the type of item found will be compared against the dig sheet for accuracy. Any deviation will be noted and reported by the UXO dig team to Parsons. The UXO team personnel excavating an anomaly shall initially remove no more than a 6-inch layer of soil or sediment at the location of the anomaly. A visual and electronic search of the excavation shall then be made. This process shall be repeated until the audible signal from the magnetometer indicates the object is inches below the surface. Once this determination has been made, soil or sediment will be removed in 2-inch increments, by hand, until the source of the anomaly is located. Excavations greater than four (4) foot in depth will not be made without prior approval of the USAESCH Safety Specialist.

6.2.4 Mechanized equipment may be used to excavate large anomalies (e.g., pits) or those deeper than four-foot if required (e.g., to confirm the anomaly is not a UXO). Any decision to use mechanized equipment to excavate these anomalies will be made by the SUXOS and the USAESCH Safety Specialist. If the excavated material is considered to be a UXO, it shall be uncovered sufficiently to obtain a positive identification of the item. If the item is identified as UXO, a determination will subsequently be made as to whether it is fuzed or not.

6.2.5 Fuzed UXO will be handled in accordance with Section 12.4 of this appendix. In no case shall the SUXOS authorize or undertake destruction of UXO when there is sufficient reason to believe that the disposal action will result in personnel casualties or property damage. Unfuzed UXO will also be handled in accordance with Section 12.4 of this appendix.

6.2.6 A detailed account of all materials (UXO and related scrap) encountered during the investigation will be maintained. A log entry will be made for UXO related

scrap materials indicating the general types of materials encountered and the weight (in pounds) found in the project areas. Scrap found to have explosive hazards will be handled in accordance with Section 6.4. Inert UXO related scrap and non-UXO scrap that are not related to CWM will be staged to a designated and secured in a fenced area near the command post, but will be stored in separate containers until certified by the Site Safety Officer (SSO) and SUXOS that the materials are inert and, if required, vented[1]. After inspection, conventional ordnance-related scrap will be stored in a secured area or locked container to prevent materials being added, which may not have been through the inspection process, before being turned over to a scrap dealer. The following five-step process for inspecting and classifying inert UXO and related scrap will be followed:

- The UXO Specialist will inspect it for explosive hazards;
- The UXO Supervisor inspects it for explosive hazards (now it can be removed from the grid and consolidated with other ordnance-related scrap awaiting verification of being free of explosives);
- The QC/SSO will inspect it for explosive hazards;
- The SUXOS will inspect it for explosive hazards, and;
- The USAESCH Safety Specialist will conduct quality audits of the procedures for inspecting, venting, and certifying the scrap free of explosive hazards.

6.2.7 Data regarding type, size, depth, condition, location, etc. of unexploded ordnance items located during field investigation will be recorded.

6.2.8 Once the scrap has been determined to be free of explosive hazards, the SUXOS and QC Specialist will sign a certificate stating that "I certify that the property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature". The scrap will then be turned over to the nearest local scrap hauler.

6.2.9 The excavation site shall be returned as nearly as feasible to an undisturbed condition.

6.3 Quality Assurance/Quality Control (QA/QC)

6.3.1 The geophysical survey process includes the following steps and considerations:

- Surveys are focused on representative subsets of the overall area of investigation at each site.
- Survey targets include buried debris, drums well as potential ordnance.

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[1]Venting of inert or OE-related scrap will be accomplished by using jet perforators to open/rupture the item.

- The instrument proposed for use was selected based on comparative performance within the field environment anticipated.
- Daily calibration checks are conducted over known items to ensure consistency in response.
- Data are processed and checked and target selections will be made with concurrence from USAESCH review.
- Locations of potential UXO will be marked.

6.3.2 The UXO Contractor Quality Control Approach includes the following:

- Evaluation of site conditions at the time of dig and comparison to basis for planned approach.
- Excavation only at flagged locations.
- Recording of anomaly excavation results and feedback to anomaly assessment.
- Careful evaluation, recovery and destruction of UXO.
- Certification of the identification and disposition of each anomaly excavated.
- Support to government quality assurance including excavation at other locations as-directed by USAESCH Safety Specialist.

6.3.3 The USAESCH Quality Assurance Approach includes the following:

- Determination of objectives through the planning step.
- Evaluation of geophysical results and participation in anomaly selection.
- Review of representative dig sheet data.
- USAESCH Safety Specialist selection of locations for quality assurance digs.
- Quality Assurance digs excavated by the UXO Contractor for the government.

6.4 On-Site Disposal Operations

6.4.1 The SUXOS will record usage data of explosives and the quantities of UXO destroyed in place. The SUXOS will be responsible for the proper use, issue, and maintenance of all explosives and records.

6.4.2 Demolition safety and operations will be conducted according to the standard practices and procedures outlined in TM 60A 1-1-31 and the appropriate specific 60 Series EOD Publications. UXO will only be detonated after positive identification. Electrical procedures will be employed as the method of choice for all detonations.

6.4.3 Demolition operations, if required, will take place at the end of each workday, and all fuzed UXO will be disposed of on that day. If an event, such as inclement weather, prevents the destruction of any UXO, arrangements will be made to provide security for the site (i.e., UXO subcontractor will secure the area, preventing

unauthorized personnel from entering). The SUXOS is responsible for determining whether minimum safe conditions to conduct demolitions operations are met. The UXO subcontractor personnel will provide perimeter security if necessary.

6.4.4 The process for determining whether scrap presents no explosive hazard will be through visual assessment and certification as described in 6.2.6 above.

6.4.5 All non-CWM related scrap, after certified free of explosive hazards, will be collected at a designated location near the command post for removal by off-site scrap haulers.

7.0 ALTERNATE TECHNIQUES

Alternate methods for disposing of UXO will not be conducted on this project.

8.0 OFF-SITE DESTRUCTION

No off-site destruction will take place during this site investigation.

9.0 TECHNICAL SUPPORT

TEU and ECBC support will be required for the CWM aspects of this site investigation. Conventional ordnance will be handled by the UXO subcontractor and CWM-filled containers will be handled and stored in the IHF by TEU. ECBC will provide for air monitoring and soils analysis. This support will be provided through USAESCH.

10.0 PUBLIC INVOLVEMENT

Public involvement for the SI at Pelham Range includes efforts conducted by Base Transition Team, Alabama Army National Guard, Mobile District, U.S. Army Corps of Engineers, and the Huntsville Center. A poster providing the public relations contact will be available onsite during field operations at both the office and mobile command post locations. The primary point of contact for public affairs is:

Major James Morrison
U.S. Army Garrison Command
291 Jimmy Parks Blvd
Fort McClellan, AL 36205
Phone:256.848.6574
Fax:256.848.2553
email: morrisonj@mcclellan.army.mil

11.0 MAPS

11.1 Regional Map

Pelham Range consists of about 22,000 acres located approximately 6 miles west of the Main Post of Fort McClellan, Alabama (Figure 1.1). The range is licensed by the Alabama Army National Guard and portions are currently used for firing. The locations of the three sites at Pelham Range are shown on Figure 1.2.

11.2 Site Maps

11.2.1 Lima Pond

Lima Pond (also known as Range L) is located in the northwestern portion of Pelham Range. The site is located near the middle of the former Toxic Area. Figure 1.3 shows the area of investigation and surrounding topography. The Lima Pond site consists of a shallow elliptical pond (0.1 acres) surrounded by a man-made berm ranging from about 5 to 15 feet in height above the pond. The water level in the pond is much higher than ground water in monitoring wells surrounding the site, implying that the water in Lima Pond is perched. The berm is topped by a chain-link fence with one locked gate with signs stating "Caution, Restricted Access, Range L (Lima Pond), Chemical Munitions Disposal Area."

11.2.2 Former Decon Area

The Former Decon Area is in the northwestern portion of Pelham Range near Lima Pond and across the road from Rideout Hall. The roughly 100 ft by 150 ft area is a hillside, gently sloping to the north, and covered with a nearly continuous canopy of trees. Figure 1.7 shows the area of investigation and surrounding topography.

11.2.3 Current and Future Land Use

All three areas are currently unused. In the future, after the sites have been characterized, they may be used for military training.

11.3 Soil Sampling Map

Soil sampling of explosives contaminated soil is not required for this site investigation.

12.0 QUANTITY – DISTANCE

12.1 OE Areas

The MPM for each area is identified in the following paragraphs and associated calculations are attached to the end of this section:

12.1.1 Lima Pond

12.1.1.1 The MSD will be based on a 90mm projectile. The maximum fragmentation distance for unrelated personnel using a 90mm projectile as the most

probable munition (MPM) is 1,955 feet. The nearest building is Rideout Hall, which is located over 2,000 feet from the site.

12.1.1.2 There are no public roads near the Lima Pond since it is well within Pelham Range. However, the range roads near Lima Pond will be blocked (i.e., temporary barricade will be placed across the road) during working hours with a sign directing personnel to contact the project site and/or the project office. These roadblocks will be under observation during explosive operations to insure NO transiting within the arcs. If the roadblocks cannot be observed from the work area, personnel with communications to the SUXOS will man them. All explosive operations will cease if unauthorized personnel enter the arcs.

12.1.1.3 The UXO team separation distance of 200 feet will be used during intrusive activities, due its greater distance than the K50 (0.9 overpressure) distance of 97 feet.

12.1.1.4 Surface water and sediment samples at Lima Pond will be collected using anomaly avoidance. Since the possibility of encountering a munition will be greatly reduced, no MPM is appropriate and the MSD for munitions will be reduced to zero.

12.1.2 Former Decontamination Area South of Toxic Gas Area

12.1.2.1 The MSD will be based on a 90mm projectile. The maximum fragmentation distance for unrelated personnel using a 90mm projectile as the most probable munition (MPM) is 1,955 feet. The nearest building is Rideout Hall, which is about 130 feet from the closest edge of the area of investigation.

12.1.2.2 There are no public roads near the Former Decon Area since it is well within Pelham Range. However, the range road leading past the Former Decon Area will be blocked (i.e., temporary barricade will be placed across the road) during working hours with a sign directing personnel to contact the project site and/or the project office. These roadblocks will be under observation during explosive operations to insure NO transiting within the arcs. If the roadblocks cannot be observed from the work area, personnel with communications to the SUXOS will man them. All explosive operations will cease if unauthorized personnel enter the arcs. In addition, Rideout Hall will need to be evacuated.

12.1.2.3 The UXO team separation distance of 200 feet will be used during intrusive activities, due its greater distance than the K50 (0.9 overpressure) distance of 97 feet.

12.2 Magazines

Explosives will be provided on an on-call basis. No magazines will be needed onsite.

12.3 Planned or Established Demolition Areas

There are no planned or established demolition areas for this project.

12.4 Blow-in-Place (BIP)

Blow-in-Place (BIP) will be used for ordnance items not safe to move. The demolition locations will be confined to the boundaries of each sub-area. Demolition sites will exist where UXOs are found and detonated. The location of UXO, which must be detonated in place, cannot be predicted, and they could occur at any point on the site. All UXO that are detonated in place will be well documented and the position indicated on the site map. Table 1, which deals with intentional detonation, identifies the minimum separation distances for all personnel for munitions or explosives that may be encountered during the investigations. If a conventional ordnance item not listed in Table 1 is encountered, its minimum separation distances shall be determined in accordance with Determination of Appropriate Safety Distances on Ordnance and Explosives (OE) Project Sites, OE Center of Expertise (CX) Interim Guidance Document 98-08. Until distances are determined, the default distances in DOD 6055.9-STD shall be used.

TABLE 1. SAFE SEPARATION DISTANCE FOR ALL PERSONNEL DURING INTENTIONAL DETONATIONS BLOW-IN-PLACE

Munition	Maximum Fragmentation Range (ft)*	Safe Blast (Over pressure) (K328W) (ft)	Minimum Separation Distances for all Personnel (ft)	Thickness of Sandbags Required (in)**
75mm Projectile	1701	373	1701	24
90mm Projectile	1955	437	1955	24
105mm Projectile[1]	1939	636	1939	24
155mm Projectile[1]	2577	817	2577	36
4.2-inch Mortar[1]	1617	661	1617	24

* This is the minimum separation distance for all personnel from the item being disposed, when the fragmentation is not being mitigated. If the item is being mitigated for fragmentation with the required thickness of sandbags, then the safe blast distance will be used as the safe minimum separation distance.

** The sandbags must be placed at least six inches away from the OE item being destroyed.

Notes:

1. The ASR reported these items were used for shell tapping and therefore, are not expected to be explosively configured.

2. The listed thickness of sandbags is the minimum thickness required to defeat design fragmentation and will be the minimum amount used in areas were potential damage to structures may occur.

3. Safe blast overpressure was calculated using the net explosive weight of the item being destroyed and the donor charge (i.e. shape charge with 38 grams of RDX and 10 feet of 80 grain detonating cord) for a total of 0.198 pounds donor charge.